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13. ABSTRACT (Maximum 200 words) Fundamental progress was made in the sequential and fixed sample detection and estimation of abrupt changes in stochastic systems and in the related problem of adaptive control of dynamical systems with time varying parameters. Advances were also made in recursive estimation and adaptive control of linear stochastic systems, optimal sequential testing of composite hypotheses, and regression analysis of censored failure time data.				
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Important advances were made during this grant period in the detection of abrupt changes of stochastic systems and in the closely related problems of modeling and adaptive control of dynamical systems with time-varying parameters. Lai presented some of these results in invited lectures in the Second SIAM Conference on Control in the 90's at Minneapolis in September, in the Workshop on Adaptive Control of the Centre de Recherches Mathématiques at Montreal in November, and in the 31st IEEE Conference on Decision and Control in December, 1992. He is currently writing a discussion paper on this subject for the *Journal of the Royal Statistical Society*, and will soon begin three other papers presenting the findings of this research. Siegmund presented some of his work in invited lectures in the IMS-AMS-SIAM Summer Research Conference on Change-point Problems and Their Applications in July, 1992, and in the Workshop on Directions in Probability of the Institute of Mathematical Statistics in August, 1993. He is in the process of writing up these results for publication.

Other fruitful directions of research were in the areas of recursive estimation in time series and stochastic systems, sequential testing theory and regression analysis of censored failure time data. Some of the results in this research have been written up in the technical reports, a list of which is attached.

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Report List

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TR No.	Title	Author(s)	Date
1.	Adaptive estimation via martingales, to appear in <u>Statistical Decision Theory and Related Topics V</u> (S. S. Gupta and J. O. Berger, Eds.), Springer-Verlag.	T. L. Lai	10-92
2.	Nearly optimal generalized sequential likelihood ratio tests in multivariate exponential families, to appear in <u>Proceedings of International Symposium on Multivariate Analysis and Its Applications</u> (T. W. Anderson and K. T. Fang, Eds.), Institute of Mathematical Statistics.	T. L. Lai L. Zhang	10-92
3.	Gaussian models for genetic linkage analysis using complete high resolution maps of identity-by-descent, in <u>American Journal of Human Genetics</u> 53, 234-251, 1993.	E. Feingold D. Siegmund P. O. Brown	10-92
4.	A retrospective of Wald's sequential analysis -- its relation to change-point detection and sequential clinical trials, to appear in <u>Statistical Decision Theory and Related Topics V</u> (S. S. Gupta and J. O. Berger, Eds.), Springer-Verlag.	D. Siegmund	12-92
5.	A modification of Schwarz's sequential likelihood ratio tests in multivariate sequential analysis, to appear in <u>Journal of Sequential Analysis</u> .	T. L. Lai L. Zhang	2-93
6.	Asymptotic normality of a class of adaptive statistics with applications to synthetic data methods for censored regression, submitted to <u>Journal of Multivariate Analysis</u> .	T. L. Lai Z. Ying Z. Zheng	3-93
7.	Inference from grouped data in three-parameter Weibull models with applications to breakdown voltage experiments, submitted to <u>Technometrics</u> .	H. Hirose T. L. Lai	3-93

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